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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,379	12/18/2001	Michael R. Sogard	PA0335-US/11269.34	1089

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The Law Office of Steven G. Roeder
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EXAMINER	
SOUW, BERNARD E	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 05/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/026,379	SOGARD, MICHAEL R.	
	Examin r	Art Unit	
	Bernard E Souw	2881	

-- The MAILING DATE of this communication app ars on th cover sheet with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 January 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *49-76 and 124-208* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *49-76 and 124-208* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04/28/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Amendments

1. Applicant's Remarks filed on 01/12/2004 in response to the Office Action dated 07/17/2003, has been entered.

No claim has been cancelled.

No claim has been amended.

No new claim has been added.

Pending in this Office Action are claims 49-76 and 124-208.

The present Office Action is made with all the arguments being fully considered.

Relevant Prior Art

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPAT # 6,014,200, issued on 01/11/2000 to the same inventor as this application (Sogard et al.), is found to claim the same invention as the present disclosure, and therefore could have been used for rejecting most of the present claims under 35 USC § 102(b), since the patent issue date is more than 1 year older than the application date of the present application (12/18/2001), and no priority is being claimed. However, since the old invention is intended for lithography, instead of for inspecting a mask as in the present invention, in this Office Action the patent is used as a prior art under 35 USC § 103(a).

Withdrawal of previous 35 USC § 112 Rejections

3. Adequate explanation has been provided regarding previous §112 2nd paragraph rejections of claims 70, 72, 186, 187, 203 and 204. Therefore, the previous rejections of claims 70, 72, 186, 187, 203 and 204 under §112 2nd paragraph are now withdrawn.

Preamble not given Patentable Weight

4. The lengthy preambles of claims 144, 161, 177 and 193 have not been given patentable weight because it has been held that a preamble is denied the effect of a limitation, where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 49-51, 67, 68 and 124-126 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakasuji (USPAT # 5,892,224) in view of Sogard (USPAT 6,014,200), Kobinata (USPAT # 6,462,346) and Muraki et al., (USPAT 5,929,454).

Regarding claims 49 and 124, Nakasuji describes a mask inspection system, comprising

- a source of electrons 1 shown in Fig.1, as recited in Col.8/ll.19-22;
- a stage 79 supporting the mask 75 shown in Fig.11, as recited in Col.21/ll.13-17;
- a beamlet shaping section 3 shown in Fig.1, recited in Col.8/ll.24-34 or aperture 71/71a shown in Fig.11, recited in Col.21/ll.3-11, disposed between the electron source 1 in Fig.1 but not shown in Fig.11 (upstream from electron beam EB) and the mask 75, as recited in Col.21/ll.13-17, the beamlet shaping section including a (first) multi-aperture array 71 having apertures 71a;
- a first electron lens group 2 directing electrons emitted from the source of electrons 1 into a collimated beam in an axial direction towards the (first) multi-aperture array 3, as shown in Fig.1 and recited in Col.8/ll.22-34;
- a second electron lens group 72 & 73 shown in Fig.11, as recited in Col.21/ll.12-13, or lens group 6 & 7 shown in Fig.1, as recited in Col.8/ll.39-41, directing each beamlet in the array towards the center of a corresponding aperture in the second multiple array;
- an electron deflector 15 in Fig.1 and 74 in Fig.11, as recited in Col.21/ll.30-36; and
- a detector assembly 81 & 83 that measures electrons to inspect the mask 75, as recited in Col.21/ll.47-65.

However, Nakasuji's device does not make use of a first and second multi-aperture arrays having apertures with a first and second shape, respectively. The use

of (at least) two multi-aperture arrays is taught by Sogard et al. in numerals 116 and 126 shown in Fig.1, as recited in Col.7/ll.1-2 and Col.7/ll.32-39, respectively.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nakasuji's one aperture array with Sogard's two multi-aperture arrays, in order to generate an electron beam of variable shapes determined by the superposition of the two apertures, as taught by Sogard et al. in the Abstract/lines 1-10.

However, Nakasuji's device and method do not make use of a beamlet blanking section disposed between the beamlet shaping section and the mask. Kobinata discloses a mask inspecting device and method as shown in Fig.2 and recited in the title and Abstract. As recited in Col.5/ll.18-32 and Col.6/ll.33-38, Kobinata's device and method make use of a blanking section 15 shown in Fig.2 and Fig.3, disposed between the mask M and the electron source 11, the latter being modified by Nakasuji's beamlet shaping section 71. In addition to Nakasuji's, the step of measuring electrons by a detector assembly under a sequential superposition of electron beamlets forming a variable-shaped exposure beam is taught by Kobinata in Col.7/ll.66-67 and Col.8/ll.1-4.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nakasuji's mask inspecting apparatus that has been already modified by Sogard by adding a blanking aperture as taught by Kobinata or Muraki et al., since such a blanking aperture would enable one of ordinary skill in the art to compose a variable shape electron beam of any desired form based on a superposition of differently shaped electron beams in timely sequential order, here

accomplished by blanking (i.e., deflecting away) the electron beam during every change of shape.

Further, Muraki et al. make use of a first electron lens group 2 shown in Fig.1 to direct electrons from the source 1 into a collimated beam in an axial direction AX towards the first multi-aperture array 3, the latter being here modified by Nakasuji's beam shaper 71 according to Muraki's teaching in Col.6/ll.61-64 regarding the equivalence between crossover image and electron source. Muraki's modification of Nakasuji's device and method also make use of a second electron lens group 41 to direct each beamlet formed by the first multi-aperture array 3 (implicated in Col.7/ll.8-13) towards the center of Nakasuji's as modified by Sogard's multi-aperture array, placed at Muraki's cross-over image shown Fig.1 between lens 43 and lens 44.

Muraki's modification of Nakasuji-Sogard's device and method further make use of an electron deflector 6 disposed between the first multi-aperture array 3 and the second multi-aperture array placed at Muraki's cross-over image between lens 43 and lens 44.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to dispose Muraki's electron deflector 6 between the first multi-aperture array 3 and the second multi-aperture array at Muraki's crossover image between lens 43 and lens 44, as modified above by Nakasuji into a second multi-aperture array, since this arrangement is conventional in the art, as disclosed by Sogard in electron deflector 128 disposed between first aperture 116 and second aperture 126 shown in Fig.1.

► Regarding claim 67, Kobinata's electron source is specifically denoted as an "electron gun" as shown in numeral 11 in Fig.1. As known in the art, electron gun can be used to generate a multiple array of beamlets, if appropriate electron optics and apertures are being used.

Alternatively, Muraki et al. disclose an electron beam exposure apparatus and method that can be used for inspecting Nakasuji's mask by replacing Muraki's wafer 5 shown in Fig.1 by Nakasuji's mask 75 or Kobinata's mask M. As shown in Fig.1, Muraki's device and method make use of a blanking aperture BA disposed between the beamlet shaping section 3 and the mask 5.

► Specifically regarding claim 68, the limitation that the MxN aperture array corresponds to the (first) multi-blanking aperture array is trivial, since otherwise the blanking aperture array will not be able to function properly.

► Regarding claims 50 and 125, Muraki's aperture BA in Fig.1 may be formed as an active blanking aperture array having M rows and N columns, as implicated in Col.9/ll.8-11 by analogy to previously recited electron beamlets 305 and 306 shown in Fig.3 and recited in Col.9/1-8. Alternatively, Muraki's aperture BA is modified by general knowledge in the art into a multiple blanking aperture in order to match the first multi-aperture array of Nakasuji's as modified by Sogard's.

► Regarding claim 51, Nakasuji's as modified by Sogard and further by Muraki's blanking aperture array BA in Muraki's Fig.1 may be alternatively switched in position with the second multi-aperture array of claim 49 or 124 at the crossover image between lens 43 and lens 44, without any effect on the function of the electron exposure device,

as generally known in the art. Under this alternative arrangement, Muraki's modification of Nakasuji's device & method further make use of a third electron lens group 43 to direct each beamlet having selected shapes towards a corresponding aperture in the blanking aperture array, now placed between 43 and 44.

The limitations of a logic circuit associated with the blanking aperture and a contrast aperture to absorb unwanted electrons and x-rays are both conventional and well known in the art, and hence, unpatentable.

Nakasuji's as modified by Sogard, Kobinata's and Muraki's further makes use of a fourth electron lens group 44 to focus the electron beamlets passing undeflected through the blanking aperture array (located between lens 43 and 44) onto the mask 5 (modifying Nakasuji's multi-aperture array 75 of Fig.11.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to switch Muraki's blanking aperture array BA in Fig.1 with the second multi-aperture array at the crossover image between lens 43 and lens 44, since it has been held that a mere reversal of the essential working parts of a device without producing any novel or unexpected results involves only routine skill in the art. *In re Einstein*, 8 USPQ 167.

► Regarding claim 69, Nakasuji's detection apparatus and method make use of a detector assembly 81+83 that measures the magnitude of the signal that passes through at least a portion of the mask 75, as shown in Fig.11 and recited in Col.21/ll.25-67 and Col.22/ll.1-25.

► Regarding claims 70-72, Muraki et al. discloses an electron beam exposure system and method making use of the magnitude of signal reflected off of an object 5 shown in Fig.1 (here Muraki's object 5 is substituted by Nakasuji's mask), in which the reflected signal detected by electron detector 9 is compared to that measured by detector 10, as recited in Col.7/ll.50-65.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to measure the electrons reflected off from Nakasuji's mask, as taught by Muraki et al., in addition to those measured by Nakasuji's detector assembly 81+83, since a comparison of the two signals would enhance the accuracy of detecting a mask defect.

One would have been motivated for using Muraki's reflected electron data to enhance the accuracy of Nakasuji's defect detection method, since it is generally well known in the art that the accuracy of a measurement can be enhanced by considering more independently measured data. This motivation is generally derived by common sense from general knowledge in the art, without a need to be taught by any prior art.

► Claims 73-76 and 140-143 are various types of claims, such as product by process, apparatus for process and object for process claims, reciting limitations which are directly or indirectly dependent to, while being fully covered in its entirety without a single exception by the limitations of the parent apparatus claim 49 and the method claim 124, respectively. Claims 73-76 and 140-143 are therefore rejected along with claims 49 and 124.

► Regarding claims 52, 54, 56, 58 (device claims) and 127, 129, 131, 133 (method claims), Sogard et al. disclose a multi-aperture/column electron beam exposure system, comprising a first and second aperture *shields* ((118 and shown in Fig.1) having M rows and N columns of apertures corresponding to the apertures in the first and second active blanking aperture arrays, the first blanking aperture *shield* being disposed between the second multi-aperture array and the (first) active blanking aperture array, and the second blanking aperture *shield* being disposed between the (second) blanking aperture array and the object to be exposed, as recited by Sogard et al. in the Abstract/ll.10-11, reciting a blanking aperture as active multi-aperture array, in Col.3/ll.20-27 reciting the need to protect the blanking apertures, in Col.4/ll.17-23 reciting the first shield protecting the first active or blanking multi-aperture array, in Col.4/ll.24-30 reciting the second shield protecting the second active or blanking multi-aperture array, and Col.6/ll.65-67 & Col.7/ll.1-16, and for a different embodiment in Col.11/ll.1-16 reciting a first shield 118 shown in Fig.6B, and in Col.11/ll.27-67 & Col.12/ll.1-11 reciting a second shield 130 shown in Fig.7A-C and Fig.8.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adopt Sogard's multi-aperture shield(s) for protecting the active multi-aperture blanking sections, in order to prevent heat from being deposited into the multi-aperture array(s) which might cause the latter to warp, as recited by Sogard et al. in Col.7/ll.11-16, and further, in Col.4/ll.50-52 and Col.12/ll.3-11.

► Claims 53, 55, 57, 59, 128, 130, 132 and 134 are also rejected for reciting limitations that are generally known to one of ordinary skill in the art.

It is generally known in the art that low atomic number materials are poor x-ray scatterers, whereas high atomic number materials are strong x-ray scatterers. To make an x-ray scattering mask using both low and high atomic number materials is therefore conventional and also well known in the art, as implicated by Sogard et al. in Col.11/ll.11-15.

► Regarding claims 60 and 135, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use at least one x-ray baffle in order to prevent unwanted x-ray generated in the aperture materials by high energy electrons from producing secondary electrons that may reach the electron detectors and falsify the measurement data.

► Regarding claims 61 and 136, it would have been obvious to one of ordinary skill in the art at the time the invention was made to dispose the x-ray baffle between the second multi-aperture array and the active blanking aperture array, since it is just the conventional position that would render the baffle function most effective, as generally known in the art.

► Claim 62 recites specific limitations regarding the fourth electron lens group being constructed of first and second symmetric magnetic doublets, the limitations being conventional as also well known in the art, and hence, unpatentable. Further limitations of their relative locations is -- apart from the design being uncritical -- also conventional and well known in the art, and hence, unpatentable.

► Claims 63 and 65 recite limitations that are uncritical, and furthermore, are mere matters of design choice. As such, claims 63 and 65 are both unpatentable.

► Claim 64 recites limitations that consist of a combination of claims 49 and 63. Claim 64 is therefore unpatentable by the same token as previously applied to claims 49 and 63.

► Claim 66 recites a memory unit for storing a next pattern logic, which is conventional, and hence, unpatentable.

► Claim 126 is a method claim version of claim 51. Consequently, claim 126 is also rejected along with claim 51.

► Claim 137 is a method claim version of claim 62, and hence, is unpatentable by the same token.

► Claim 138 is a method claim version of claim 63, and hence, is unpatentable by the same token.

► Claim 139 is a method claim version of claim 66, and hence, is unpatentable by the same token.

► Regarding claim 144, the limitation of a beamlet cross-section shaped of at least a triangle is disclosed by Sogard et al. in Fig.5C through Fig.5F, and a rectangle in Fig.5G to Fig.5I, as recited in Col.9/ll.31-67 & Col.10/ll.1-5.

► Regarding claim 161, the limitation of a first multi-aperture array of a first shape having its first section substantially shaped as a hexagon, is disclosed by Sogard et al.

in Fig.5A, showing a section of the first shape 502 as being a hexagon, as recited in Col.9/ll.31-36 and further emphasized in Col.9/ll.43-45.

► Regarding claim 177, the limitation of a deflector to deflect the shaped beamlets to fill-in the spaces between adjacent shaped beamlets to substantially complete (one of) the desired patterns, is disclosed by Sogard et al. in Col.4/ll.1-8 and Col.16/ll.52-54.

► Regarding claim 188, the limitation that the two apertures are different in cross-section, size and/or shape, is rendered obvious by Sogard et al. in Col.9/ll.31-67 & Col.10/ll.1-8.

► Regarding claim 147, the limitation of a cross-sectional size of at least 50 percent of the size of the desired areas is well known in the art as being uncritically determined by the heat dissipated by electron beam stopped and deposited in the opaque areas, as indicated by Sogard et al. in Col.12/ll.12-60, which can be estimated from Fig.5C through Fig.5I.

► Regarding claims 150-154, 165, 166, 179-181 and 196-198, the additional limitation that the plurality of spaced apart beamlets is simultaneously directed towards the mask is recited by Nakasuji et al. in the Abstract/ll.5-8 & Col.2/ll.37-42, and is also inherent in Muraki's, as recited in the Abstract/ll.9-15. Furthermore, the use of more than one (ten to one thousand or even ten thousands or more) shaped beamlets is inherent in Nakasuji's, Muraki's and Yamada's. To increase the number of beamlets is a mere duplication of parts that does not produce any new or unexpected result, and

furthermore, only involves routine skill in the art. Therefore that additional limitation does not make the claims allowable.

► Regarding claim 193, the limitation that a control section adjusts the positions of the first and the second multiple aperture arrays so that the shape of the beamlets can be easily changed between a first shape and a second shape different than the first one is recited by Sogard in Col.16/ll.33-34 showing control section 113 in Fig.1 consisting of control circuit 165 having an input 168 controlling the electron deflector 128, which directs the beam from the first multiple aperture array 116 to a specific portion of the second multiple aperture array 126 so as to change the shape of the beam as it passes through the second multiple array 126, as recited in Col.8/ll.4-16, especially in lines 13-16. Specifically, the easiness of such a change of shape is expressly recited by Sogard in Col.9/ll.17-30, especially in lines 25-27.

► Claims 162-164, 178, 194 and 195 recite the same limitations of a beamlet cross-sectional shape of a triangle and/or rectangle as recited in claim 144. Therefore, claims 162-164, 178, 194 and 195 are rejected for the same reason and over the same prior arts as claim 144.

► Claims 157-160, 173-176, 189-192 and 205-208 are various types of claims, such as product by process, apparatus for process and object for process claims, reciting limitations which are directly or indirectly dependent to, while being fully covered in its entirety without a single exception by the limitations of the parent claims 144, 161 and 177, respectively. Claims 157-160, 173-176, 189-192 and 205-208 are therefore rejected along with their respective parent claims 144, 161 and 177.

► Regarding claims 148, 149, 171, 172, 186, 187, 203 and 204, the limitation of inspecting the mask by comparing the magnitudes of the signal measured by the detector assembly, I_0, with the signal of the beamlet that is directed toward the mask (I_T, I_S and I_R), or just by comparing I_T, I_S and I_R with each other, is conventional and also generally known to one of ordinary skill in the art, as already acknowledged by Applicant himself in his arguments against a previous § 112 rejection, as recited on pages 2-3 of Applicant's Remarks filed 01/12/2004 in response to the Office Action dated 07/17/2003 (see above).

6. Claims 145, 146, 155, 156, 167-170, 182-185 and 199-202 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakasuji in view of Sogard, Kobinata and Muraki et al., and further in view of Yamada et al. (USPAT # 6,137,111).

Nakasuji as modified by Sogard, Kobinata and Muraki et al. shows all the limitations of claims 145, 146, 155, 156, 167-170, 182-185 and 199-202, as previously applied to the parent claims 49, 124, 144 and 161, except the limitation of similarities in shape, pattern, or cross-sectional size and shape between the beamlets and at least a portion of the (opaque, transparent, desired, or inspected) patterns or areas of the mask being inspected.

Yamada et al. disclose a multiple beam exposure system for inspecting a mask, as recited in the Abstract, line 1, wherein Yamada's aperture is here representing a mask in general sense. Yamada's multiple beam is made to have the same shape as the mask, as recited in the Abstract/ll.7-19.

It would have been obvious to one of ordinary skill in the art by the time the invention was made to shape the inspecting beam with the same shape and size as the mask to be inspected, since the deviation of the received signal waveform from a defective mask as compared to that of an intact mask will be most conspicuous that way, as described in steps S26 and S27 of Yamada's Fig.7.

Final Rejection

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Omission of three prior art references and a rearrangement of the remaining references with respect to the specific claims being addressed are also necessitated by Applicant's remarks or amendment. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Respons to Applicant's Arguments

8. Applicant's arguments filed 01/12/2004 have been fully considered. The following is Examiner's response to Applicant's arguments.

► Applicant's arguments regarding the previous §112/2nd paragraph rejections is quite persuasive, and very well accepted by the examiner. Therefore, the previous §112/2nd paragraph rejections of claims 70, 72, 186, 187, 203 and 204 have been withdrawn. In return, Applicant's well-accepted argument, i.e., that the method of inspecting a mask by comparing the magnitudes of the signal measured by the detector assembly, I_0, with the signal of the beamlet that is directed toward the mask (I_T, I_S and I_R), or just by comparing I_T, I_S and I_R with each other, is conventional and also generally known to one of ordinary skill in the art, is now being used in this Office Action to reject Applicant's claims 148, 149, 171, 172, 186, 187, 203 and 204.

► Regarding Applicant's argument that none of Nakasuji's, Kobinata's, Muraki's, Itoh's, Shimura's and Yasaka's prior art references recite the use of two multiple aperture arrays, it is noted that Applicant can not show nonobviousness by attacking references individually where the rejections are based on combinations of references under 35 U.S.C. §103. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this regard, Nakasuji's first aperture 3 shown in Fig.1 is a multi aperture array (so is also Muraki's first aperture 3 in Fig.1), whereas Itoh's second aperture 116 shown in fig.1 or 16 in Fig.2 is also is a multiple aperture array, so that a combination of Nakasuji's and Itoh's

will result in a first multiple aperture array (adopted from Nakasuji) and a second multiple aperture array (adopted from Itoh).

Note, there are many other combinations of the 6 cited prior art references that result in two multiple aperture arrays as claimed by Applicant, such that the previous §103 rejections are proper. How to combine the two apertures in one system is known to one of ordinary skill in the art. As a matter of fact, only one of less than ordinary skill in the art would not know how to combine them.

In this Office Action, the examiner is ready to cite Sogard as a further reference that uses two multiple aperture arrays in one single system. This, however, is not to be considered as a change or different ground of rejection, since (a) the previous §103 rejections are proper, and (b) Sogard has been previously cited and used as a prior art reference for rejecting claims 52-66, 127-139 and 144-192.

► Regarding Applicant's argument that Nakasuji provides no incentive for using different shapes for the spaced apart beamlets, Applicant is again attacking the Nakasuji's reference individually, since different shapes for the spaced apart beamlets is rendered obvious by Muraki, as shown in Fig.2 showing in detail multi aperture array 3 of Fig.1 consisting of different aperture patterns A, B, C, D, E, F and G, which further consists of different aperture elements, as recited in Col.8/ll.9-19.

► Regarding Applicant's argument that Nakasuji provides no incentive for giving the beamlets the same cross-sectional size or the same pattern as one of the desired areas, Applicant is again attacking the Nakasuji's reference individually, since the

incentive is rendered obvious by Yamada, as recited in the above rejection of claims 145, 146, 155, 156, 167-170, 182-185 and 199-202.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 703 305 0149. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes
April 21, 2004

JOHN R. LEE
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